BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 2. SALEM, MASS., NOV. AND DEC., 1870. NOS. 11, 12.

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FIELD MEETING AT METHUEN, THURSDAY, SEPT. 18, 1870.

[*Concluded from page* 160.]

After a few general remarks from the PRESIDENT, alluding to this first visit of the Institute to the town, Mr. F. W. PUTNAM was called upon as the first speaker. He spoke of the dry time as illustrated by the present state of the Spicket River, and the swamps about the pond. He selected as the theme of his remarks some Indian stone implements which some one had placed upon the stand. He urged the importance of making collections of these aboriginal relics as a means of tracing the progress and movements of the several Indian tribes. Their line of migration could be traced by finding the particular kind of stone of which the articles were made, and then comparing a large number of these relics gathered in different sections of the country. He then described the several implements which were either donated or placed on the table for exhibition, as hatchets, arrowheads, sinkers for nets, knives and grain pestles.

Rev. N. M. WILLIAMS, of Methuen, made a short speech, in which he spoke of the pleasure with which the people welcomed the Institute to that town; and, alluding to the name of the place, said it was supposed to be named after a certain Lord Methven, which easily became Methuen.

Prof. E. S. MORSE, of Salem, compared the manufacture of hats, which had been witnessed by most of the party, to the formation of the egg, and traced, in his usual happy manner, the modification or change of condition which each had undergone in its development.

He took up and described some fresh water clams, which had been found during the forenoon, and explained their difference from the common salt water clams.

Rev. T. G. Grassie, of Methuen, alluded to the reputation of Essex County, and spoke of the necessity of the meetings of the Institute being held in the same place often, and the oftener the more successful. He thought that these meetings were just what was needed. He alluded to science and religion, and said that as a religious man he did not fear science, for if there was anything in religion that science could correct, it should be corrected. He mentioned a new machine now in operation in this town for making wheels, and spoke of its great utility.

Mr. C. M. Tracy, of Lynn, in speaking of the pleasure it gave him to visit Methuen, said that he was convinced that a plain, unpretending New England town often had more of comfort and thrift in it than many other places which were dignified by the name of cities. Proceeding to examine the botanical specimens on the table, he remarked that the *Sarracenia*, or Pitcher Plant, fine samples of which lay before him, was one of the most remarkable things to be found among our vegetation. Differing so largely from all other plants as to constitute a separate family of its own, it included only one or two genera and a few species, real eccentrics of the floral world. One species is with us, another in the South, a third, of a different genus, in South America, but there are not many more. The vasiform leaves are a constant character, and it is no small problem among the scientific, to find how it happens that they are always supplied with water even in the severest drought. Such a drought is now raging, almost without precedent, yet the friend who brought these found them half full, while the peat moss around them was so parched as to crackle under the feet. It is always so. It is plainly no catching and saving of rain, for none has fallen. Some have thought it a secretion from the plant itself; but the speaker inclined to ascribe it to the condensation of dew on the upper part of the leaf, running down to supply the tank below, which is kept cool for the purpose by the slow evaporation through the permeable sides. But any way considered, it is a beautiful and curious plant, wholly American, and fitly known as the Huntsman's or Forefather's Cup.

In exploring about the Falls to-day he had found some good specimens of the Blue Gentian (*G. Andrewsii* or *saponaria*). This is not the lovely Fringed Gentian of Bryant's well known poem, though it comes at the same season and is almost as beautiful. This species, as well as one or two others, is remarkable for never expanding its flowers; so that what appear here as full grown buds are rarely perfect blossoms, never exposing the interior organs. All our Gentians are blue, but in other lands there are red species, and a splendid yellow one (*G. lutea*) in Central Europe, whose root is an important medicine, intensely bitter in taste.

Perhaps the most remarkable thing brought forward in this line to-day, was a huge cluster of orange-colored fungi, detached in one mass from the decayed wood, where they grew, and served up in a dish like a pile of tempting cream cakes. The speaker disclaimed the critical knowledge of those that would enable him to give the exact name; but as to their general character there could be no question. These are plants of exceeding simplicity of structure, whose proper framework and growth consist of mere tubular, branching cells, running every way through the decaying substances where they seat themselves, and interlacing to a plexus little inferior to the felt of a Methuen hat. From this living felt, or *mycelium*, rises, here and there, a bud-cell, growing often to a great size, and developing, for floral and reproductive purposes, to such strange and curious forms as we see in the mushrooms of the table, and in these fungi of to-day, and ten thousand others beside. We generally suppose the toadstools we see are the whole plants; but really they are only the flowers or what answers therefor. Thus will be seen the real explanation of another botanical puzzle. Fungi having been found to evolve carbonic acid, while plants in general give off oxygen, it was inferred that their economy was of the reverse order, and that they were peculiarly deadly in their character, and nourished by decay and corruption. But when we look at them as only the flowers of a concealed vegetation, we remember that all expanded flowers thus yield carbonic acid, while the oxygen is only thrown off by the green leaves, and only very slightly where there are none of these, as in broomrapes and parasitic-dodders. So the anomaly vanishes and the constitution of these singular things is found to be much the same as in other vegetation. To any one at all conversant with vegetable chemistry, it would be a mystery indeed, how a plant with greater power of development than we see anywhere else, built up of just such cells, and these of the same chemical substance as in other plants, should not show the same results from its vital processes in other respects as they. And thus, also, very much disappears from that character of gloom and deadliness that so many have been prone to ascribe to these innocent plants. It is not, indeed, true, that they feed more than others upon decay; the farmer nourishes his choicest crops with as corrupt matter as ever fed a fetid toadstool, and we think no harm of it. The glossy goldthread and the fragrant twinflower prefer as deep shadows as these, but no one thinks them deadly. The whole of this talk about associating fungi, and death, and charnel-houses, is but a relic of the old time superstition, and of that ignorance which it is the blessed mission of "Star-eyed Science" to counterwork and dispel.

The PRESIDENT alluded to this town as the birthplace of Judge White, the first President of the Institute, who held the office from its organization in 1848 to his decease in 1861, and who was one of its most liberal contributors, having donated, at several times, nearly 8000 volumes to the library; he called upon Rev. T. T. STONE, formerly of Salem, who made a brief response, bearing testimony to his excellence and worth.

Mr. PUTNAM exhibited a dress, presented to the Society by Mrs. Tyrrel of Methuen, which probably had been made by the Indians of the Northwest coast of America. He read a circular from Prof. C. H. Hitchcock, of Hanover, N. H., soliciting aid from all friends of scientific research and mountain explorations, to enable Prof. J. H. Huntington, Assistant Geologist of the State of New Hampshire, and his associates, to spend the next winter (1870-1) upon the top of Mount Washington, with all the needed comforts of life, the proper instruments, and the means of communicating by telegraphic cables daily reports of their observations. He remarked upon the importance of the proposed expedition, and commended its claims upon the public.

Brief remarks were then made by Messrs. Chas. Ingalls, Joseph How, and others of Methuen.

After unanimously adopting the following resolutions, the meeting adjourned.

Resolved, That the thanks of the Essex Institute be tendered to the Selectmen of Methuen for the use of the Town Hall; also to Messrs. Joseph How, Wm. M. Rogers, Charles Ingalls, Samuel G. Sargent, John Low, Ebenezer Sawyer, E. A. Archibald, Albert Dame, Rev. Messrs. C. A. Bradley, James Noyes, T. G. Grassie and N. M. Williams, Mrs. Williams, Mrs. Grassie, the Misses How and the Misses Barker, and other ladies and gentlemen who have aided in giving interest to the meeting this day.

* * *

REGULAR MEETING, MONDAY, OCTOBER 3, 1870.

President in the Chair.

T. P. Abell and David Wentzell, both of Salem, were elected resident members.

REGULAR MEETING, MONDAY, NOVEMBER 7, 1870.

President in the Chair.

Edward D. Ropes and William G. Webb, both of Salem, were elected resident members.

QUARTERLY MEETING, WEDNESDAY, NOVEMBER 9, 1870.

President in the Chair.

The following amendment to the constitution having been submitted at the annual meeting in May, and the quarterly in August, was unanimously adopted.

Instead of Article 1, substitute the following: — "Article 1:—The objects of the ESSEX INSTITUTE are the collection and preservation of materials for the Civil and Natural History of the County of Essex, and the advancement of Science, Literature, and the Arts."

Miss Lucy Larcom of Beverly, Charles H. Goss, Isaac M. Gattman and George R. Harris, all of Salem, were elected resident members.

REGULAR MEETING, MONDAY, DECEMBER 5, 1870.

The first evening meeting of the present season was held at the rooms in Plummer Hall. The President in the Chair.

Records of preceding meeting read.

The Secretary announced the following correspondence: —

Abell, T. P., Salem; Ames, James T., Chicopee, Oct. 1; Ames, R. W., Boston, Oct. 14, 17; Andrews, Wm. P., Salem, Aug. 18; Appleton, Francis H., West Peabody, Oct. 7; Ball, Mary F., Presidio, Oct. 15; Bergen Museum, Oct. 1; Bolles, E. C., Brooklyn, Sept. 30; Boston Public Library, Nov. 29; Brooks, H. A., Salem, Oct. 21; Brooks, W. G., Boston, Nov. 17; Buffalo Historical Society, Oct. 28, Nov. 14; Calkins, W. W., Chicago, Ill., Oct. 20; Chamberlain, James A., Salem, Oct. 9; Chipman, R. M., Ware, Mass., Oct. 11; Choate, Abby P., Salem, Nov. 11; Cogswell, Geo., Bradford, Nov. 26; Edgerly, Albert W., Lynn, Nov. 12; Endicott, Robert R., Beverly, Oct. —; Emery, Geo. E., Lynn, Oct. 18; Gattman, J. M., Salem, Nov. 18; Goss, Chas. H., Salem, Nov. 14; Higbee, Chas. H., Boston, Sept. 22; Iowa Historical Society, Nov. 19; Johnson, A. H., Bradford, Oct. 13, 19; Kongelige Danske Videnskabernes Selskab, Nov. 5; Larcom, Lucy, Beverly Farms, Nov. 5, 21; Lincoln, S., Jr., Salem, Oct. 13; Loring, A. K., Boston, Nov. 2, 4, 7, 17; Lath, M., Cincinnati, Nov. 2, 3; Maine Historical Society, Nov. —; Massachusetts Historical Society, Nov. 26; Minnesota Historical Society, Sept. 30, Oct. 20; Moravian Historical Society, Nov. 18; Munsell, Joel, Albany, N. Y., Oct. 24; New England Historic-Genealogical Society, Oct. 27, Nov. 26; New York Genealogical Society, Nov. 14; New York Lyceum of Natural History, Oct. 4; New York State Library, Sept. 7, 19, 22, Nov. 5; Pickering, Mary O., Salem, Oct. 15; Pingree, David, Salem, Sept. 9; Preble, Geo. H., Charlestown, Nov. 21; Rhode Island Historical Society, Nov. 3; Ropes, Edward D., Salem, Nov. 17; Silliman, B., New Haven, Oct. 28; Silsbee, J. L., Salem, Sept. 5; Simonds, J. R., Salem, Sept. 24; Seymour, C. J., Binghamton, N. Y., Sept. 9; Upham, W. P., Worcester, Mass., Nov. 17; White, W. O., Keene, N. H., Sept. 15; Wiggin, John K., Boston, Oct. 15; Woolsey, Theodore D., New Haven, Nov. 23; Woodward, A., Franklin, Conn., Nov. 16.

The Librarian reported the following additions: —

Donations.

APPLETON, WM. S., of Boston. Ancestry of Priscilla Baker, 1 vol. small 4to, Cambridge, 1870. Genealogy of the Coffin Family in New England, 8vo. pamph. Description of a Selection of Coins and Medals in America, 8vo pamph.

BARLOW, JOHN, Legislative Documents of Mass. for 1870, 3 vols. 8vo. Miscellaneous pamphlets, 41.

BROOKS, HENRY M., Medical and Agricultural Register, 1 vol. 8vo. Letters on American Slavery, 1 vol. 16mo. Miscellaneous pamphlets, 3.

BROWNE, ALBERT G., Miscellaneous pamphlets, 120.

BROWN, EDWARD, Lynn Weekly Mirror for 1825-6, 1 vol. folio.

CALLER, JAMES M., Thirty-two Guide Books to places in Europe.

CHAMBERLAIN, JAMES A., Miscellaneous pamphlets, 215. Flint's Geography, 1 vol. 8vo, Boston, 1833. New York Gazetteer, 1 vol. 12mo. Albany 1842, Miscellaneous vols., 13.

CHAMBERS, ROBERT B., of Providence, R. I. Commemorative Discourse in Providence, Oct. 18, 1868, by James G. Vose, Pastor, 1 vol. 12mo.

CITY OF PROVIDENCE. Providence City Documents, 1869-70, 1 vol. 8vo.

CLOUTMAN, WM. R., of Charleston, S. C. Report on Agriculture, for 1868, 1 vol. 8vo, Washington, 1869. United States Coast Survey for 1867, 1 vol. 4to, Washington, 1869. Land Office Report for 1868, 1 vol. 8vo. Report of the Select Committee on the Memorial of Davis Hatch, June 25, 1870, 1 vol. 8vo, Washington. Also several pamphlets.

EMERY, GEO. E., of Lynn. Almanac and Register for 1757, 1 vol. 12mo, Dublin. Farmer's Almanacks from 1833 to 1858, and several Manuscript Papers.

FOOTE, CALEB. Files of several County papers for Aug., Sept., 1870.

GEEEN, S. A., of Boston. Report of the School Committee of Boston for 1869, 1 vol. 8vo. Miscellaneous pamphlets, 105.

HALL, B. H., of Troy, N. Y. Daily Programme of the 19th Meeting of the American Association for the Advancement of Science held at Troy, N. Y., 1870, 12mo. pamph.

HAMMOND, CHARLES, of Springfield, Mass. Catalogue of Monson Academy for 1870, 8vo. pamph.

HAWKES, N. M. Water Report of Lynn for 1870, 1 vol. 8vo.

HOBART, Mrs S. Cox's View of America, 1 vol. 8vo, Phila., 1795.

HYATT, A. Texas Almanac for 1870. Miscellaneous pamphlets, 70.

KNIGHTS, B. R. The Independent for 1855-6-7, 1860-61 and 1862-63, 3 vols. folio.

LEE, JOHN C. Commercial Bulletin for Sept. and Oct., 1870.

LINCOLN, SOLOMON, of Boston. Centennial Anniversary of the Town of Cohasset, May 7, 1870, 8vo. pamph.

MACK, WM. Miscellaneous pamphlets, 18.

MOULTON, HENRY P., of Beverly. Legislative Documents of Mass., for 1870, 4 vols. 8vo.

MUNSELL, JOEL, of Albany. Transactions of the Albany Institute, vol. iii, vi, 2 vols., Albany, 1855, 1870. Troy Directory for 1860, 1 vol. 12mo. Schenectady

Directory for 1860-61, 1 vol. 12mo. Hudson Directory for 1851-52, 1 vol. 16mo. New York City Directory for 1853-54, 1 vol. 16mo. Fall River Directory for 1859, 1 vol. 16mo. Taunton Directory for 1861, 1 vol. 16mo.

PACKARD, A. S. Miscellaneous pamphlets, 12.

PARSONS, C. W., of Providence, R. I. Memoir of Usher Parsons, M. D., of Providence, by the donor, 1 vol. 12mo, 1870.

PERKINS, GEO. A. Address of Mr. Everett, and Poem of Dr. O. W. Holmes, at the dinner given to H. I. H. Monseigneur, the Prince Napoleon, Sept. 25, 1861, 1 vol. 12mo, Cambridge, 1861. Miscellaneous pamphlets, 108.

PEYTON, JOHN LEWIS, of London. Over the Alleghanies and across the Prairies, 1 vol. 12mo, London, 1869.

PICKERING, MARY O. Almanacs from 1733 to 1811.

PIERSON, G. H. Legislative Documents of Mass. for 1867-68, 4 vols.

POOLE, WM. F., of Cincinnati, Ohio. The Witchcraft Delusion of 1692, by Gov. Thomas Hutchinson, with notes by the donor, small 4to, Boston, 1870. Forty-first Annual Report of the Common Schools of Cincinnati, June 30, 1870, 8vo pamph.

PREBLE, G. H., U. S. N. Genealogical Sketch of the Preble Family in America, 1 vol. 8vo, Boston, 1868.

RICE AND BELL, of St. Paul, Minn. St. Paul Directory for 1869-70, 1 vol. 8vo.

ROGERS, WM. M., of Methuen, Mass. Annual Report of Methuen, Feb. 1, 1870, 8vo pamph. Carleton's Lecture in Methuen, Feb. 9, 1863, 8vo pamph.

SALEM EAST INDIA MARINE SOCIETY. Acts of Incorporation and By-Laws, 12mo pamph., Salem, 1870.

SEYMOUR, C. J., of Binghamton, N. Y. Manual of the Broome County Medical Society, 8vo pamph., 1870.

SILLIMAN, B., of New Haven, Ct. Directory of Grass Valley for 1865, 1 vol. 8vo. New Haven Directory for 1869, 1 vol. 12mo.

STANIFORD, D., of Boston Highlands. Thirty Miscellaneous Numbers of Juvenile Newspapers.

STONE, E. M., of Providence, R. I. Annual Report of the School Committee of Providence, June, 1870, 8vo pamph.

TUCKER, JONATHAN. Narrative of the Captivity and Removes of Mrs. Mary Rowlandson, written by herself, 1 vol. 16mo, Lancaster, 1828.

UPHAM, J. BAXTER, of Boston. Typhoid and Typhus Fever, as it occurred in the Boston City Hospital, by J. B. Upham, M. D., from June 1, 1864, to June 1, 1869, 1 vol. 8vo, Boston, 1870.

UPTON, JAMES. Christian Review, 28 vols. 8vo. Lemprier's Universal Biography, 2 vols. 8vo. Hayward's New England Gazetteer 1 vol. 8vo. Sartain's Union Magazine for 1830, 1 vol. 8vo. National Almanacs, 1863-4, 2 vols. 12mo. Boston Almanacs, 1839 to 1868, 27 vols. 18mo. Salem Directory for 1864, 1 vol. 12mo. Manners and Customs of the Jews, 1 vol. 12mo. Putnam's Semi-Monthly Library, 23 vols. 12 mo. The Crescent and the Cross, 2 vols. 12mo. Eleanor, 1 vol. 12mo. Home Influence, 2 vols. 12mo. The Trials of Margaret Lindsay, 1 vol. 12mo. The Mother's Recompense, 1 vol. 12mo. The Foresters, 1 vol. 12mo. Eothen, 1 vol. 12mo.

VERRILL, A. E., of New Haven, Ct. Miscellaneous pamphlets, 15.

WATERS, H. F. Report of the School Committee of Boston for 1869, 1 vol. 8vo.

WATERS, J. LINTON, of Chicago, Ill. Transactions of the Illinois State Agricultural Society, vol. 7, 1867-8, 8vo, Springfield, 1870. (2 copies.)

WHIPPLE, GEORGE M. The Nightingale, 1 vol. 16mo. Portsmouth, 1804. Chants, 2 vol. 12mo. Hymn Book, 1 vol. 8vo, oblong.

WOODWARD, A. Life of Gen. Nathaniel Lyon, by A. Woodward, 1 vol. 12mo, Hartford, 1862. History of Franklin, Conn., by A. Woodward, 1 vol. 8vo, New Haven, 1869.

By Exchange.

Académie des Sciences, Belles-Lettres et Arts. Actes de l' Académie Impériale des Sciences, Belles-Lettres et Arts de Bordeaux. 3e Série, 30, 31 Années 1868-1869, 8vo, Paris, 1868-9. Prix décernés par l' Académie, 8vo, Bordeaux, 1870.

Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique. Bulletins 2me Sér, Tome 27, 28, 38me Année 1869, 8vo, Bruxelles, 1869. Annuaire de l' Académie, 36me Année, 12mo, Bruxelles, 1870.

Albany Institute. Transactions, vol. vi, Albany, 1870.

Archiv fur Anthropologie. Zeitschrift für Naturgeschichte und Urgeschichte des Menchen. Vierter. Band, 4to, Braunschweig, 1870.

Connecticut Academy, Transactions of. Vol. ii, Part i, 8vo pamph., New Haven, 1870.

Connecticut Historical Society, Collections of. Vol. ii, Hartford, 1870.

Iowa State Historical Society. Annals of Iowa, for Oct., 1870, 8vo pamph.

Michigan State Agricultural College. Catalogue of the Officers and Students, 1876, 8vo pamph.

Minnesota Historical Society. Collections, vol. iii. Part i, 8vo pamph.

Moravian Historical Society. Transactions. Part iv, 8vo pamph.

Museum of Comparative Zoology. Bulletin, vol. ii, No. 1, 8vo pamph, 1870.

New England Historic-Genealogical Society. New England Historical and Genealogical Register, Oct., 1870.

New York Lyceum of Natural History. Proceedings, vol. i, Sigs. 1, 2, 3. Annals, vol. ix, Sigs. 23, 24, 25, 26.

New York State Library. New York State Documents for 1864, 1865, 1866, 1867, 1868, 1869, 121 vols. 8vo. Laws of New York for 1864, 1865, 1866, 1867, 1868, 1869, 10 vols. 8mo. Regent's Report for 1865, '66, '67, '68, '69, 5 vols. 8vo. N. Y. Civil List, 2 vols. 12mo, 1869-70. N. Y. Manuals from 1841 to '70, 12 vols. 16mo. N. Y. State Register, 1830, '4, '5, '40, '3, '5, 6 vols. 12mo. Royal Calendar, 6 vols. N. Y. Directories, 1857, '60, '67, 3 vols. 8vo. Rochester Directories, 1853, '54, '55, '61, 3 vols. 12mo. Troy Directories, 1857, '58, '59, '60, 4 vols. 12mo. Schenectady Directories 1857, '58, '62, '63. Albany Directories, 1860, '62 '63. Brooklyn Directories, 1856, '67 '68. Milwaukee Directories, 1851, '52, '56, '57, '58. Oswego Directory, 1864, '65. Poughkeepsie Directories, 1856, '57, '59, '60. Hudson Directory 1856, '57. Documents relating to the Colonial History of N. Y., 1 vol. 4to, Albany, 1861. Miscellaneous pamphlets, 640.

Philadelphia Academy of Natural Sciences, Proceedings of. May, June, July, and Aug., 1870.

Publishers. American Journal of Science. American Literary Gazette. American Naturalist. Book Buyer. Boys' Journal. Canadian Journal. Christian World. Cosmos. Eclectic. Essex Banner. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Land and Water. Lawrence American. Literary World. Little Giant. Lynn Reporter. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Quaritch's Catalogue. Sailors' Magazine and Seamen's Friend. Salem Observer. Sotheran's Catalogue. The Weekly Public Spirit.

Sociéte Linnéenne de Bordeaux. Acts. Tome xxiv, 5 (1868), 6 (1870). Tome xxvii, 1, 1870, 8vo.

Vermont Historical Society, Collections of. Vol. I, 8vo. Montpelier, 1870.

Vermont State Library. Twelfth Registration Report of Vermont for 1868, 1 vol. 8vo. Journal of the Proceedings of the Constitutional Convention of Vermont, 1 vol. 8vo, 1870.

The President mentioned that the fiftieth anniversary of the organization of the Essex Historical Society would occur on Friday, the 21st of April next, and suggested the propriety of having some notice taken of this event. After remarks from several members, on motion of Mr. James Kimball it was *voted:* That arrangements be made for an appropriate celebration, under the directions of the Lecture Committee.

Mr. James Kimball exhibited a map containing an outline of the Peninsula of Salem situated between the North and South Rivers, with the indentations and coves, as it was in 1626, when Roger Conant and his companions landed and formed the first permanent settlement in the Massachusetts Bay Colony, so far as it could be ascertained by consulting the records, and from other sources. He gave a brief description of the same, tracing the shore line from the northeastern point near the terminus of Beverly Bridge to the square in Peabody, thence around the neck which has undergone few changes, and on the southern side to the mill pond.

The physical character was noted, the land on the North River rising in some places somewhat abruptly from the river, especially on the western end, gradually tending to the south. The south side had also several abrupt hills with openings between, sloping down to the river. These elevations were no doubt covered with wood; the pine on the sand hills on the north, and the harder woods on stronger lands in the centre and on the south. There were depressions of swampy lands (now clearly indicated) extending nearly the whole length; undoubtedly shallow ponds at some early period filled in with vegetable accumulations and by the denudation of the higher lands; the eastern portion about sixteen feet and the western about twenty-two feet above mean high water. This irregularity of surface has been modified, the elevations furnishing materials for the depressions, so that at the present time we find it comparatively level. Many of our streets have been raised since the commencement of the present century, from one to three feet. The soil is light and sandy loam with gravel and sand underlying; in some places, with a substratum of clay. Those places that were originally swampy are clearly defined by the black muck underlying. After alluding to the ledges in the western section of the town, the surface rocks, and the character of the vegetation, he concluded his interesting communication with a brief résumé of the principal changes that have occurred, especially those within the recollection of our older inhabitants.

Mr. Kimball intends to speak on this subject, more fully, though perhaps in a somewhat modified form, at a future meeting of the Institute.

REGULAR MEETING, MONDAY, DECEMBER 19, 1870.

President in the chair. Records of preceding meeting read.

The Secretary announced the following correspondence:—

U. S. Dept. Interior, Oct. 31; New York, Secretary of State, Dec. 8; Buffalo Historical Society, Dec. 12; Emden, Naturforschende Gesellschaft, Oct. 1; Leeds Philosophical and Literary Society, Sept. 5; London Society of Antiquaries, Nov. 23; Lüneburg Naturwissenschaftliche verein, July 21; Maine Historical Society, Dec.; Munchen Das Bibliothekariat der Konig. Bayer Akad. der Wissenschaften, Sept.; New England Hist. Gen. Society, Dec. 12; Brooks, H. A., Salem, Dec. 8; Hall, F. H., Chicago, Dec. 11; Leavitt, J. H., Salem, Dec. 12; Paine, Nath'l, Worcester, Dec. 2; Perkins, James, Boston, Dec. 13; Poole, W. F., Cincinnati, Ohio, Dec. 14; Prescott, W., Concord, N. H., Nov. 29; Roberts, Adeline, Salem, Nov. 23.

The Librarian reported the following additions to the Library:—

By Donation.

MASSACHUSETTS STATE DEPARTMENT. Massachusetts Public Documents for 1869, 4 vols. 8vo, Boston, 1870. Acts and Resolves of Massachusetts, 1870, 1 vol. 8vo.

U. S. SURGEON GENERAL'S OFFICE. Annual Report of the Surgeon General, U. S. A., 12mo pamph., 1870.

FROM AUTHORS. Address by B. F. Butler, in Music Hall, Boston, Nov. 23, 1870, 8vo pamph. Writings of Wm. G. Goddard, by his son, Francis W. Goddard, 2 vols. 8vo, Providence, 1870. Lecture by C. Sumner, "The Duel between France and Germany," 8vo pamph.

HOLDEN, N. J. Massachusetts Legislative Documents, for 1869, 1870, 14 vols. 8vo.

LAMSON, G. W. Physical Media in Spiritual Manifestations, 1 vol. 12mo, Philadelphia, 1869.

LEE, JOHN C. Commercial Bulletin for Dec., 1870.

PERKINS, JAMES, of Boston, Mass. Centennial Memorial of the Lodge of St. Andrew, 1 vol. small 4to, Boston, 1870.

PUTNAM, Mrs. EBEN. Miscellaneous pamphlets, 37.

STONE, ALFRED, of Providence, R. I. Providence Daily Journal from January to June, 1870, inclusive.

WATERS, J. LINTON, of Chicago, Ill. Annual Report of the Board of Education of Chicago, for 1870. Biennial Report of the Treasurer of Illinois, 1 vol. 8vo, Springfield, 1867.

By Exchange.

BALTIMORE, MD., PEABODY INSTITUTE. Proceedings, on the Announcement of the death of Hon. J. P. Kennedy, who died Aug. 18, 1870; 8vo.

BOLOGNA, ACCADEMIA DELLE SCIENZE DELL' ISTITUTO. Rendiconto delle Sessioni An. Accad., 1868-69.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings, Vol. 13, Sig. 19.

COPENHAGEN, KONGELIGE DANSKE VIDENSKABERNES SELSKAB. Oversigt over det Kongelige Danske Videnskabernes Selskåbs Forhandlinger og dets Medlemmers Arbeider i Aaret, No 6, 1868, No. 4, 1869, and No. 1, 1870, 8vo, Kjobenhavn.

KONGELIGE NORDISKE OLDSKRIFT-SELSKAB. Mémoires de la Société Royale des Antiquaires du Nord, 1866, '67, '68, '69, 8vo, Copenhagen. Tillæg til Aarboger for Nordisk Oldkyndighed og Historie, 1866, '67, '68 '69, 8vo. Oldnasdisk Ordlog af Erik Jonsson, 8vo, Kjöbenhavn, 1863.

DRESDEN, NATURWISSENSCHAFTLICHE GESELLSCHAFT "ISIS." Sitzungs-Berichte, April, Mai, Juni, 8vo, Dresden, 1870.

EMDEN, NATURFORSCHENDE GESELLSCHAFT. Jahresbericht, 1868, 8vo.

FRANKFURT, ZOOLOGISCHE GESELLSCHAFT. Der Zoologische Garten. Zeilschrift für Beobachtung Pflege und Zucht der Thiere. Herausgegeben von Dr. F. C. Noll, Jahrg. xi, 6 Nos. 8vo, Frankfurt, A. M., 1870.

LUNEBURG, NATURWISSENSCHAFTLICHER VEREIN. Jahreshefte, 1868-9, 8vo.

MUCHEN, KONIGLICH BAIERISCHE AKADEMIE DER WISSENSCHAFTEN. Sitzungsberichte, 1869, 1870.

MOSCOU SOCIÉTÉ IMPERIALE DES NATURALISTES. Bulletin, Année 1869, No. 4, 8vo.

NEW JERSEY HISTORICAL SOCIETY, Proceedings of. Vol. ii, No. 2, Second Series, 1870, 8vo.

QUEBEC LITERARY AND HISTORICAL SOCIETY. Transactions, New Series, Part 7, Session of 1869-70, 8vo, Quebec, 1870.

PUBLISHERS. American Naturalist. Christian World. Essex Banner. Gardeners' Monthly. Gloucester Telegraph. Haverhill Gazette. Historical Magazine. Lawrence American. Little Giant. Lynn Semi-Weekly Reporter. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Quaritch's Catalogue. Salem Observer.

The following donations to the Historical Department were announced:—

DOWNIE, MRS. E. A. An old Memorial Pitcher—an engraving of the Boston Massacre, March 5, 1770.

FLOWERS, WILLIAM H. Fifty Dollar Bill of Confederate currency.

HOBART, MRS. SARAH. An old Spinning Wheel for woolen yarn.

TUCKER, JONATHAN. An Umbrella and a Parasol of the fashion of 1804.

George F. Choate of Salem, Mary O. Hodges of Salem, and Mary W. Bemis of Chicopee, were elected members.

Mr. F. W. PUTNAM made a few remarks on two specimens of interest which had recently been added to the Museum of the Peabody Academy of Science. One of them was a fish not before known in Massachusetts waters. This specimen was a species of *Hemiramphus*, a genus of tropical fishes belonging to the flying fish family. The species represented by the specimen on the table was probably a West Indian fish that had strayed from its natural waters and followed the Gulf Stream until it neared the Massachusetts coast—had entered our North river, and followed it up until it reached the millpond at Danversport, where, in consequence of the water being too fresh, it died and had been washed ashore. The specimen was found on the shore of the millpond and given to SAMUEL P. FOWLER, Esq., of Danvers, who presented it to the Academy. This was the first instance of a species of the genus *Hemiramphus* having been found in Essex County waters, and though a straggler, and hence not a regular County fish, was still a most perfect and interesting addition to the large ichthyological collection of the Academy.

The other specimen of which he spoke was that of a woodchuck, presented to the Peabody Academy by D. W. SMEAD, Esq., who found it in the Adirondack region. This skull showed a singular abnormal growth of the two incisor teeth of the upper jaw. The right incisor had been forced somewhat from its proper line of growth, and was about three times its normal length, while the left incisor had continued to grow in the line of the natural curve of the tooth, and had made a complete circle, passing through the bones of the roof of the mouth, and curving under the nasal bone, had passed through the premaxillary bone, penetrating it at the side of its original position, and had continued to grow in its circle until it had again penetrated the bones of the roof of the mouth and was just passing through the premaxillary a second time, when the animal died, probably from starvation. In explaining how this extraordinary growth had taken place, Mr. Putnam gave an account of the formation, structure and growth of the incisor teeth of the Rodents, and showed how by the constant wearing away of the softer parts of the incisor teeth on the inside surfaces of the teeth of the upper and under jaws, the teeth were kept constantly sharpened, and their edges worn away as fast as the growth took place, and how in case of injury or loss of the two opposing teeth in the under jaw, an abnormal growth would take place as in the case of the specimen in hand.

The President then introduced Mr. WILLIAM MAYNARD, of Montreal, stating that his lecture would be highly interesting to the tanners and curriers of the city, and referring in complimentary terms to the editor of "The Hide and Leather Interest," who had spent some time in Salem last summer, and had published a considerable amount of interesting historical information with regard to the tanneries of Salem, which had been reprinted in the Salem papers.

Mr. MAYNARD then addressed the audience as follows :—

The earliest authentic account that we have of the employment of means for curing, preserving and tanning leather, is found in the history of the Egyptian people. They, it seems, steeped the skins in a bath made of meal and water, for a few days. This softened the fibrine and gluten, as also the albumen of hide, and served also to expel the serum, etc. The hides were then submitted to the influence of a strong decoction, or more probably the expressed juice of the Periploca sycamone, generally known as the Devil's Weed, found in great abundance at the present day upon the plains of Arabia, and used by the people of those sections for a similar purpose at the present day, namely, to depilate and prepare the skin for preservation — which may be termed the combination process — as they use flour, oil, native kalium and a decoction made from a species of Quercus

Rhus and Acacia, and thus hypothetically we are able to surmise the possible method employed by the Egyptians. That they had reached a state of perfection in the art is proved from the writings of Herodotus, for the process of unhairing was performed by them in from four to five days; and as a further proof of their proficiency we will quote from the 36th chapter of Exodus, verse 19: —

> "And he made a covering for the tent, of rams' skins dyed red, and a covering of badgers' skins above that."

The Jews having been in bondage in Egypt for many years, considering the period to which this quotation refers, it is not unreasonable to suppose that the knowledge of tanning and dyeing skins which they then possessed had been acquired from the Egyptians; and so we find a similar system adopted by all the Eastern nations up to the present day — that is; the process called by us of the present day leather-dressing, — and employed particularly for the preparing and finishing of what is called Morocco leather. The very name implies its origin. The Greeks and Romans produced this description of leather in great abundance, as is proved by the writers of that day in describing the foot-gear of the wealthy. Athens excelled in the manufacture of dyed leather — purple and red, especially purple. The Moors and also the Turks were and are at the present day exceedingly skilful in the art of leather dressing.

I have seen an Eastern currier, a Turk, I believe, take a hog skin, and covering a slab of slate or marble with water, he strewed over it a sort of millet seed; then commenced, at first gently, to set the skin firmly upon the seeds; and having accomplished this, he then crushed them, as it were, into the skin; afterwards carefully taking it up, it was left to dry; when dry, the seeds were brushed off, and behold, in addition to the indentations, each partook of some shade of prismatic color. Shagreen leather, in the manufacture of which the Eastern nations excelled, received its peculiar impressions by similar means, only the seed employed was harder, and thus we have the initial method of pebbling. It is amusing to note the difference between the parent and the progeny, namely, the pebbling machine of the present day.

The probable improvements made by the Romans were doubtless utilitarian, inasmuch as during their northern conquests they would of course come among a people who, from sheer necessity, would have discovered a more serviceable covering for the feet than that in use among the nations of the East, and the Roman, with his knowledge of the arts, would to a certain extent remedy the defects. That the Romans knew much of the art of preserving and dressing leather may be inferred from the fact that Ovid and other writers make frequent mention of the covering for the feet and legs; thus we are told of the sandal of the soldier, attached to the leg by straps of leather.

In Europe, and in the British Isles especially, according to Cæsar, there was a great quantity of cattle; and furthermore we are informed that the natives sold the hides because they did not understand the art of tanning them. Therefore, when we find (a few years after the Roman conquest) the Britons employed in tanning operations along the banks of all the principal streams, we can come to no other conclusion than this — that the Romans taught them (the Britons and also the Irish) the art. In all probability their teachers were the early Christian Missionaries, or those enduring voluntary exile for the sake of religion, and we are supported in this hypothesis by the fact that the mountaineers of Wales, as also the people of Ireland, for many centuries monopolized the knowledge of the art of tanning and currying; also that the peculiar shaped shoe called by the Irish, brogue, and by the Britons clog or clogue, were similar in every respect to the ocrea of the Roman. Brogan leather, which is a sort of russet leather, unwhitened, evidently took its name from the brogue or brogan. The Saxons seem to have had very little knowledge of the art; indeed, we have no record that they knew it at all.

After the Norman conquest various articles are mentioned as being made of leather, among which are the cuirass, a sort of armor, worn by the warrior of that day, and certainly of Norman origin, as its name implies. In fact, the reputed father of William the Conqueror (if we may give any credence to the history of such a remote time) was a tanner. During the crusades there is abundant room for supposing that those who returned brought with them additional knowledge of the art of leather dressing, if not of tanning and currying; certain it is that the art, and, as it was also termed, mystery, of tanning and currying was conserved by the monks, as there were many towns in England that were founded by the monks; the ancient documents showing that they (the monks) were largely engaged in tanning and its auxiliary, currying, and doubtless considered it, as they described it, "ye art and mistirie," although long after their time it took the manipulator five, and in some instances, seven years before leather was considered tanned, and yet I hear some persons state that we have made little improvement. I hold in my hand a piece of cowhide tanned in six days. This is tanned after the formula of Professor Zippi, who unfortunately died in this country some months back, before he had made himself known.

Zippi's process is somewhat similar to that of Bordier's, the salt being a sub-sulphate of iron peroxidized, prepared from the proto-sulphate of the same metal, by digestion in diluted nitric and sulphuric acid. It is then diluted; hydrated peroxide of iron is used to strengthen it; it must be frequently stirred. Skins are tanned in this way in from three to six days, and hides from eight to twelve days. There are other processes where the skins are prepared in chrome salt and afterwards in a sesqui-oxide of iron or peroxide. These are finished in bi-chromate of potash and alumina. Sulphate of potash has been recommended. I would prefer to use (if using salts metallic) the nitrate of sodium. The salt found in South America is preferable.

The combination tannages of England originated, I think, in the town of Warrington, and also in the neighborhood of Leeds. In Warrington the combination consisted of mixing potash and sulphuric acid together in the first liquors and finishing in divi divi, myrabolams and valonia. Vacuum tan-pits were also in use by some tanners of this place, which were, I think, eventually relinquished. At Joppa, in the vicinity of Leeds, the combination consisted of mixing terra japonica and sumac together in conjunction with sulphuric acid; the pelts which were chiefly E. I. kips, were also bated or drenched in a peculiar manner, the excrement of hogs being used as a drench, and before they were exposed to the action of the lime they were softened in an ammoniacal liquor made from nitre, blood, and the exuvia of dogs. There is to-day scarcely a pure oak-bark tannage in the country — all are combinations to a greater or less extent.

We will commence with the

LIMING PROCESS.

Calcium is found in prolific abundance in almost every part of the world; its uses are multifarious and the history of its usefulness is found in the oldest records — in the ruins of Pompeii as well as in the most recent buildings of modern times.

As a caustic alkali it has the property of decomposing every description of animal and vegetable fibre; it is this property that renders it so serviceable to the tanner, inasmuch as it attacks the fibre of the hide, whilst its alkaline character saponifies the fatty and nitrogeneous matter, thereby setting free the ammonia, which in its affinity for sulphur attacks the hair bulbs and performs the depilatory process. It is soluble in water at about six hundred times its weight.

The anatomy of the hide, the general formation of the hide, consists of a network of fusiform cells, divided into distinct parts, called by the physiologists the epidermis or scurf skin, the cuticle or true skin, and the fibrous membrane; its chemical constituents are nitrogeneous, with a modicum of sulphur. The latter is found principally in the hair; it may be described as gelatine, which is N. or nitrogen, fibrine, N. S., or nitrate of sulphur; hence when brought into contact with milk of lime, hydrogen forms an affinity with nitrogen and lime, hence ammonia, N. H. 3; this attacks sulphur and thus the desired result is obtained.

Old limes become Nitrate of Calcium, N. 05, and saponaceous, and as in this state it is very deleterious to the hide, you will therefore avoid as much as possible the danger of allowing your limes to become too much saturated with nitrogenized matter; use only enough for the time; sulphur will always assist the lime. I would have made several experiments, only that I had not the apparatus. I propose the use of an apparatus for liming, such an one as I have had in private use for some time past.

DRENCHES.

The exuvia of fowls and reptiles yields upon exposure to a humid atmosphere oxylate of ammonia; in water, with considerable agitation, carbonate of ammonia; thus you perceive the intuitive process of agitating the drenches from time to time. The ammonia is taken up by the hide whilst the carbon is combined with the lime, forming carbonate of lime, or chalk, which is very injurious to the hide, and when in excess prevents the necessary reduction. The test for the presence of chalk is to take up in a glass some of the suspected impure drench and drop into it a few drops of acetic acid. Effervescence or foaming will indicate the presence of chalk. In large tanneries a quantity of air may be blown into the drench until the lime is precipitated, when the supernatant liquor of ammonia may be drawn off and used again with a small addition of excrement.

I have found that weak liquors, rich in acid produced by mucilaginous ferment are of great use in reducing the skin and expelling the lime. Baths of sulphurous acid are also as good (if properly managed) as drenches made from exuvia, especially if uric acid in proper proportions be held in intimate solution with the acid.

SWEATING PROCESS.

Sweat-houses are made, as you all know, by building a place almost air-tight, through which water or steam is caused to pass. H. is evolved, affinity for N. is disengaged and ammonia is formed, first from water vapor; 2 vols. H., 1 vol. O. form 2 vols. aqueous vapor, and 3 vols. of A. V. — 1 of N. form ammoniacal gas, and ammonia has a great affinity for sulphur, and the greatest quantity of sulphur is found in the mucous canal of the skin, consequently the roots of the hair are decomposed by the caustic action of ammonia, and thus depilation is secured. This method is not to be recommended for upper leather, as the fatty portion of the hide is not by this means sufficiently decomposed, and to use acids strong enough for the purpose would injure the texture of the skin, it being too thin. I have seen a few days since, in the tannery of Mr. Rawlston of Bertheu, a compound process. The lime-house is part a sweat-room; he uses sulphur in the limes; the hides are exposed to the action of the ammoniacal gas as well as the action of lime, and are limed very low. They use no drenches. A very fair description of leather is the result. This process might (if improved) answer very well for hides intended for buff leather, because time is saved and the hide is rendered thicker for the splitting operation.

In tanning we have noticed the method of reducing the hide or skin employed by the Egyptian, the Arab, as also by the Indian of this country. The antiquity of the mode or method is beyond a question, as we find the process of smoking the hide resorted to by all of them as the final process, and this brings to my mind carbolic acid, since the creosote of smoke has the property of tanning the hide, and the two are so similar that it seems surprising any one should consider the use of carbolic acid in the light of a new discovery. I remember some years since, while experimenting on some sheepskins, my surprise at finding that picric acid had completely tanned some of them, upon which it (a diluted solution) had accidentally fallen. If I had known then as much as I afterwards learned in relation to picric or carbozotic acid, there would have been no occasion for surprise, since the formula for it is with little difference the formula of carbolic acid.

There is no doubt but that carbolic acid, if used in conjunction with a preparation similar to that adopted by the Egyptian, the Arab, and also the Indian of this country, would make an excellent description of soft leather, but it is decidedly injurious if used in combination with tannic acid. Indeed the French calfskins owe their peculiar softness to the method and the material employed, being somewhat similar in their character and effect upon the skin to that produced by the formula I have just mentioned; and here I would make a few remarks upon French tanning. The French tanners in general produce a very poor description of stock; true it is that in the neighborhood of Strasbourg, Nantes, Tours and Bordeaux, as also Paris, a superior article is produced, but until within a few years past the art of producing stock, known in this country as French calf, was confined to only a few men. In fact, so late as 1824, the art was entirely unknown to the French, they having been taught the mystery by some enterprising Irishmen who found their way there about that time. Before I leave the tanning department I would state that in sole leather too great care cannot be taken in properly semi-drying and oiling before rolling. Oil and water, together with a little rosin, should be mixed together and lightly spread over the surface of the hide before it is placed under the roller; this will give a better polish, a higher color, and at the same time tend to obviate the objectionable property of cracking, which I am sorry to see some sole leather possesses.

And now we will enter the

CURRYING SHOP.

Here I would earnestly impress upon your minds the necessity there is, first, for careful shaving, or skiving, more especially for calf-skins; let the shoulders and shanks be left *full; take nothing off more than you can take off with the back of the knife;* so that there may be something left for the stuffing, without having the thin place disfigured by patches of oily supersaturation; be careful, also, not to dry them in the *sun!* I had forgotten to mention the scouring. Let everything be well scoured in water at about ninety degrees F., if you want weight, color and surface; do not grudge the labor of scouring upon both flesh and grain, and if any difference, let the flesh have the most of it. And now I must say a few words about the stuffing ingredients. I am afraid that I have already taken more than the time allotted for the lecture, and have thus suppressed some portion of it; nevertheless, I would state that we should endeavor to have the hide when converted into leather, as tough, as soft and as fine as it was before we deprived it of its fatty matter in order to render it *leather.* We must learn how to put back all the elements we deprived it of. Oil and tallow will not do this! The softness acquired in leather by saturation with stuffing is similar to the lubrication of the hinges of a door — it softens it and causes rough parts of the fibre to slip; it in fact lubricates it; but when it has evaporated, it leaves the hide as hard and as brittle as it was before it was stuffed at all.

In conclusion, gentlemen, I would say something about extracts and tanning materials, only that I am interested in the manufacture of extracts. Yet if there is any one here who feels interested in the same branch of industry, I shall be very happy to speak with him about it when the lecture is over. We have all the materials for manufacturing every description of leather as good as it can be made in any country in the world! I myself will undertake to tan and curry a skin with materials to be found in this country, equal to any goods produced in France. We have sumac, the quercus of every kind, and last, though not least, the *Abies Canadensis*, the hemlock tree! With the extract of this and sumach, we can produce leather worthy of the country, and I think that is saying a good deal. I do not want to travel this road alone, and I do not think a more appropriate place than this Salem can be found to commence classes for the study of chemistry in its application to tanning and currying. With this I will conclude, thanking you very much for your kind attention.

After the close of the lecture, remarks were made by several members, and a vote of thanks was passed to Mr. Maynard for his interesting and instructive lecture.